IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appln No:	10/594,157
Applicant:	Ian Alastair KIRK
Filed:	February 26, 2006
For :	Downhole apparatus for mobilising drill cuttings
Art Unit:	3676
Examiner:	FULLER, Robert E.
Attorney Docket:	ZQ120/07001

Commissioner of Patents and Trademarks
PO Box 1450
Alexandria VA 22313-1450

DECLARATION UNDER 37 C.F.R. 1.132

S I R:

I, Paul Gwyn Williams, of Aberdeen, United Kingdom, hereby declare and state as follows:

1) I am a qualified drilling engineer. My qualifications and experience are set out in the attached curriculum vitae, marked as exhibit 1. I have worked in the field of oil well drilling for 9 years. My current position is drilling engineer for the GB oil and gas company Talisman Energy. My duties at Talisman are to

plan, supervise and conduct the drilling of oil and gas wells, including directional drilling. I am not an employee of the Assignee of application 10/594,157, Downhole Products, and my employer Talisman Energy is not affiliated with the Assignee of application 10/594,157.

2) I have read and understood the present US Application Serial No. 10/594,157. I have also read and understood the amendment and response to Office action that was mailed on July 28, 2010, the final Office Action dated September 3, 2010 issued on the present application, and the prior art documents of Buttolph (US 2,589,534) and DeBray (US6,032,748) which were mentioned in the final Office action dated September 3, 2010.

3) The invention in the present application No. 10/594,157 (the Kirk invention) relates to apparatus for mobilizing drill cuttings in a well. The Kirk invention of the present application has one or more vanes on a sleeve, and a bearing region with a bushing rotatable on the bearing region. The bushing has blades, and the relative rotation of the bushing and sleeve means that the blades and vanes are rotatable relative to one another.. The sleeve is axially split along one side thereof which can open and close around the drill string so that it can be clamped onto the string of e.g. drill pipe.

4) Buttolph discloses a drilling guide that is formed as an integral part of the heavy weight drill collar forming the bottom hole assembly (BHA). See the Figures 1-3 of Buttolph which show the drill guide B and C being located on the large diameter heavy weight drill collar forming the BHA. Buttolph states

that his tool was designed to "provide a drilling assembly which will effectively control the directional action of a drilling bit to cut the desired well bore".

5) Typically the BHA in any well being drilled is under enormous stresses, as it is the part of the drill string that bears the brunt of the impacts from cutting through the formation. About 90% of the drill string weight is typically found to be in the BHA. Therefore BHA components in general need to be very rigid and robust due to the extreme forces that they will face in use.

6) It is an established technique to control the direction of the drill bit by setting down additional weight at the surface top drive, in order to transmit this additional force down the string to the BHA, so as to influence the direction of the hole that is cut by the bit on the end of the string. Buttolph's device is designed for use in this method of controlling the direction of drilling by the bit. The Buttolph device acts as a fulcrum for the drill string, and it remains in place while the BHA is tilted in the well in order to control the direction of the bit. Therefore, the Buttolph tool needs to be even stronger than most BHA components as it needs to withstand not only the usual extreme lateral and axial stresses that face any BHA component on a daily basis, but also it needs to remain intact and in place to act as the fulcrum and resist and react against the forces involved when additional weight is applied to the string from the top drive in order to control the direction of drilling of the drill bit as described by Buttolph.

7) The Buttolph tool structure is designed to be ...."simple and rugged so that there is no danger of it becoming fouled or its parts becoming detached in the course of operation." (column 2 lines 1-4 of Buttolph). As well as being extremely strong and able to withstand the high stresses encountered near to the bit, it is extremely important that during drilling operations nothing comes detached from any BHA component, especially the Buttolph device, as the dropped parts from the component hinder drilling, damage the bit and will of course interfere with the correct functioning of the component.

8) Drilling bits sometimes become stuck in the hole they are drilling. This is usually resolved by setting down weight onto the BHA to force the drill bit past or through any obstructions. In order to assist in freeing the Buttolph device when it becomes stuck, the Buttolph sleeve has cutting blades at each end which are designed to cut into the formation from the wall of the well bore so that the Buttolph device can be dislodged should there be a tendency for the guide to become "stuck in the bore" (see column 7 line 20). During any such cutting process, the Buttolph device would focus all of the weight above the device on these cutting structures at the ends of the body.

9) I have been asked by Downhole Products to provide my opinion concerning whether or not a skilled person would be motivated to modify the Buttolph device to split it along one edge and clamp it to the string, like the device shown in DeBray, rather than incorporating it into the string as a cylindrical sub with no split, in the manner taught by Buttolph.

10) I consider that any drilling professional of merely ordinary skill who was contemplating any modifications to the Buttolph device as disclosed in US2589534 would not be tempted to change Buttolph's design to clamp it in place rather than integrating it with the BHA. Specifically, I consider that it would be clear to any such person of ordinary skill that the Buttolph design of sleeve could not safely be clamped onto the drill string, because a clamp would decrease the structural integrity of the modified device and would make it more likely that the modified Buttolph device would fail. Some of the known problems with components becoming detached from the BHA and interfering with drilling as set out in my paragraph 7 above arise directly from clamped devices that break off or lose bolts which drop down to the bit and interfere with the drilling process.

11) In particular, any normally skilled person would immediately appreciate that if the Buttolph device were to be modified to a clamp on design rather than the integral design that is disclosed by Buttolph, and then clamped onto the BHA instead of being formed integrally in line with it, then the very high forces that are routinely applied to the BHA would inevitably rip the modified clamp-on Buttolph variant from the string, or would cause it at least to lose bolts or other components of the clamp, which would then cause a dropped object problem by dropping down the hole and interfering with the drilling process.

12) The Buttolph device needs to be assembled integrally in line with the string and could not be clamped in place like the Kirk invention. One reason for this is that it is common during drilling operations for the string to become stuck in

the hole and in such cases, the remedy would be to try to free the string by subjecting it to very high axial forces applied by setting down weight from the surface. Buttolph mentions this at column 7 line 20, indicating that the Buttolph sleeve is typically pressed down against the blockage, in order to cut itself free by means of the blades . This involves the substantial weight of the drill string (perhaps 50-60,000 lbs) being set down on the stuck Buttolph device. I consider that this force alone would be entirely sufficient to strip any modified clamp-on variant from the string.

13) Also, as taught by Buttolph at column 7 lines 15-28, it is an important aspect of the Buttolph design that if the sleeve is stuck in this manner, then it can be jarred free in such circumstances. Jarring is a technique of freeing stuck strings from wellbores, and involves incorporating some free axial travel in the string so that the weight of the string can be accelerated for the axial extent of the permitted travel to strike a hammer portion against an anvil portion on the tool, and thereby dislodge it where the force applied by setting down weight is not sufficient to free the stuck string. Jarring involves incredibly high axial shocks being transmitted across the stuck portion. In this case, the notion that it would be acceptable to modify the Buttolph design to be clamped onto the string rather than integrated into it and THEN to jar that modified assembly is completely fanciful. Any skilled drilling engineer would realise that jarring (which is important and desirable to Buttolph) is completely incompatible with the possibility of clamping the sleeve onto the string. Any clamped sleeve would almost certainly be ripped clean from the string during any jarring operations, because it would not be able to withstand the huge axial forces

involved in even modest jarring operations. No well operator would ever permit such a tool to be used on their wells, and no drilling engineer would ever contemplate it as a serious possibility.

14) If a modified drill guide were to be stripped from the BHA in this way or otherwise damaged during a jarring operation, fixing this would be a very difficult remedial operation. The damaged components that fell from the modified clamp on guide could not be recovered from the hole without first removing the stuck string. Fishing operations to recover stuck strings and damaged components are difficult enough and expensive enough when the damaged component is quite near to the surface, but in the case of the Buttolph device, it is only very going to be deployed near to the BHA at the very bottom of the well. Therefore, any fishing intervention to recover debris from a broken clamped-on version of Buttolph's drill guide would be incredibly expensive as the target for recovery and repair would practically be at the bottom of the well, and given the extreme likelihood that any modified sleeve would suffer such damage this is just another reason why a skilled person would not for one moment consider modifying the Buttolph device to make it a clamp-on instead of an integral design as shown by Buttolph.

15) For these reasons, I am convinced that any normally skilled person would not modify Buttolph in any way that was likely to reduce the structural integrity of the device after the modification was carried out, and so would not modify the Buttolph device to make it a clamp on instead of an integral device.

16) I note that the Kirk invention described and claimed in US Application Serial No. 10/594,157 requires a clamp as an essential feature of that system. The feature of the clamp is not shown in Buttolph and makes the Kirk invention quite different from the Buttolph system. Also, there are significant advantages that could not have been predicted from the Buttolph disclosure, which arise directly from clamping of the sleeve around the drill string. In particular, the string to which the sleeve is clamped does not need to be broken to apply the Kirk device, and so this saves very expensive operator time in applying the claimed device to the string because the sleeve can be opened to fit around the assembled drill string even while the drill string is in use and retaining fluids within its bore, which can be done at the rig floor without interrupting the continuity of the string.

17) The clamp in the Kirk invention also allows greater flexibility for the operator to choose where he wants to clamp the device onto the string. He is not limited to particular positions as he would be with the Buttolph device.

18) Also, more of the Kirk devices could be clamped onto the string so that they were present at higher concentrations in particularly problematic points on the string, for example at corners in the hole, or within sandy layers in the formation. This is not possible with Buttolph's system.

19) All of these factors can be modified in the Kirk system at the rig floor, without affecting any upstream components of the string, and without affecting the length of the string. This makes it much easier to assemble the string using

more conventional and widely available drill string components, rather than bespoke items that have to be manufactured with higher tolerances because they are being incorporated into the string like the Buttolph device. This also makes it easier to assemble the string.

20) Also, the Kirk invention can easily be fitted to drill strings of different diameters, with differences in tolerance being accommodated by the clamps, allowing greater flexibility for the operator when the string is being made up. Also, as it can be clamped onto the middle of the pipe without being passed over the ends, the Kirk device does not need to be threaded over ends of tubulars, which can often be oversized as is common with pin and box arrangements. None of these advantages are foreseeable from a reading of Buttolph.

21) In my 9 years of working in the oil and gas well drilling industry I have never seen any structure like that of the Kirk invention, and I believe it to be novel and not obvious.

22) I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that wilful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such wilful

false statements may jeopardize the validity of the above-mentioned application or any patent issued thereon.

Date: 31/1/11 Signed: ....

Paul Gwyn Williams

Witnessed by .... (Witness signature)

Kevin Grant .... (Print witness name)

Exhibit 1 to declaration of PAUL WILLIAMS

CAREER HISTORY

Oct 06 – Present Talisman Energy UK Ltd (Contractor)

Dec 09 - Present **Position: Drilling Engineer (Drilling Engineering Group)**

Currently Well Work Project Leader for the Monarb (Cayley/Shaw) field development. Both the Cayley/Shaw fields will be developed as subsea wells and tiebacked to the Montrose platform.

Key responsibilities:

- Prepared the well design document for the field development (5 development and 2 water injector wells).
- Responsible for the budgetary cost estimates for each of the wells; using Peak P1 and Rushmore programmes.
- Focal point for the wells department throughout the planning stage.
- Involved with the completion design of both the development and water injector wells.

Nov 08 – Dec 09 **Position: Operations Drilling Engineer – Ocean Nomad (Semi-Submersible)**

Godwin Appraisal HT (22/17-4 & 4z) & Shaw Appraisal HT well (22/22a-7)

Commenced at the conceptual design stage for both wells and provided operations drilling support for Godwin and currently the Shaw well.

Key responsibilities:

- Captured lessons learned from offset wells and risk assessed the well in preparation of the AFE.
- Prepared the well AFE using Peak P1 & Rushmore and responsible for supplemental AFE for further geological sidetracks.
- Responsible for all engineering calculations for drilling operations (i.e. Casing design, torque & drag and bit hydraulics). Use of Wellplan and Stresscheck software to model all aspects of well design and operational parameters.
- Prepared the drilling programme and responsible for supplemental programmes throughout the well.
- Analyzed past drilling performance & offset performance and accountable for bit selection and post performance reporting.
- Prepared material load out lists for the well and responsible for all daily drilling costs.
- Monitored the daily drilling progress and assisted the rig with any technical issues.
- Applied new technology during operations based on lessons learned from offsets wells.
- Acted as Superintendent during holidays and the last few months of the Ocean Nomad contract.
- Regular visits to the rig during well operations.
- Compose final EOWR for each well.

Mar 08 – Nov 08 **<u>Position: Operations Drilling Engineer – Ocean Nomad (Semi-Submersible)</u>**

Ross Development well (13/29a-A4 (RP14))

Provided operational input during the feasibility and conceptual design stage of the Ross well whilst operational on the Cayley well. Ross was a re-entry of a pre-existing well (RP1) and was designed to increase recovery from the Ross field by accessing an un-swept area near RP1. The well was successfully drilled & completed within AFE and has since increased the production rate of the Ross field.

Key responsibilities:

- Responsible for the isolation and abandonment design of RP1.
- Accountable for the design of the RP14 drilling well path.
- Assisted the completion & subsea engineer with the slot recovery design and operations.
- Provided the same key responsibilities as a drilling engineer during well operations.

Nov 06 – Mar 08 **<u>Position: Operations Drilling Engineer – Ocean Nomad (Semi-Submersible)</u>**

Cayley Exploration HT well (22/17-3, 3z, 3x and 3y)

Commenced at the conceptual design stage of the Cayley well and worked closely with the Cayley G&G asset team prior to spud date and provided operations drilling support during the well, Provided additional support for the upgrade of the Ocean Nomad as it was not suitable for high temperature wells.

Aug 01 – Oct 06 Applied Drilling Technology International (ADTI) *Division of GlobalSantaFe Drilling UK Ltd*

ADTI manages the drilling process on either a Turnkey (fixed prices) or project management basis for various smaller operators such as Tullow, RWE and Newfield. Joined ADTI as a graduate drilling engineer and followed the 5 year graduate development plan.

Oct 05 – Oct 06 **<u>Position: Drilling Engineer / Night Supervisor – Newfield UK</u>**

Appointed as an onshore drilling engineer for the conceptual design stage. During operations I was assigned to the ENSCO 85 as NDSV for Newfield in the Southern North Sea.

Key responsibilities:

- Prepared the casing design and drilling program.
- Involved in the tendering process for the selection of service companies for the well.
- Accountable for bit selection.
- Prepared material load out lists for the rigs.
- Provided the same key responsibilities as a NDSV during operations.

Nov 03 – Oct 05 **<u>Position: Night Drilling Supervisor – RWE / Newfield / Tullow / Lundin</u>**

Assigned as a Night Drilling Supervisor on various offshore installations for different operators. A majority of my NDSV experience was found on Jack-Up's and drilling in the very challenging Southern North Sea. Also NDSV on the GSF Arctic II for a single exploration well in the Northern North Sea.

Jack-Up's –, Noble Ronald Hoope (RWE), ENSCO 80 (Newfield UK Ltd) and GSF Labrador (Tullow UK Ltd).
Semi Submersible – GSF Arctic II (Lundin)

Key responsibilities:

- Accountable for proper execution of the drilling program by the drilling contractor and service providers throughout the night.
- Assisted in the co-ordination of all the service companies, ensuring time and satisfactory performance.
- Assisted the Day Drilling Supervisor as the onsite HS&E representative, addressing such issues and communicating the same to all site personnel.
- Responsible for preparing morning drilling reports, cost reports and sub-contractor evaluations
- Captured lessons learned and chaired "After Action Reviews" for each operation.
- Ensured that the work was done efficiently and safely.
- Accountable for casing tally and cement calculations.
- Coordinated and managed logistics and POB movement.

Mar 03 – Nov 03 **Position: Wellsite Drilling Engineer – Burlington Operations**

Assigned to the ENSCO 85 as a Well-Site Engineer for Burlington. Burlington drilled five "sour gas" wells in the East Irish Sea (1 exploration, 1 Subsea and 3 development wells).

Aug 01 – Mar 03 **Position: Trainee Drilling Engineer – Shell operations**

Allocated to the GSF BRITANNIA as part of the rig crew, primarily worked as a roustabout (9 months), then as an extra roughneck (9 months) and finally an assistant derrickman (6 months). The Britannia was drilling underbalanced gas wells in the Southern North Sea. Spent one week during field break in the office assisting with planning for future wells and attended several drilling engineering courses throughout the year.

QUALIFICATIONS, CERTIFICATES & TRAINING

- **Geology and Petroleum Geology (Hons) 2:2** – Aberdeen University (July 01)
- **International Well Control Drilling Supervisor Certificate** – Combined Surface & Subsea BOP stack – exp Nov 2010
- Completed numerous in-house and external technical and managerial training courses throughout career.

HOBBIES

- Playing golf, football, running hill walking and traveling.

COURSES ATTENDED

Course Name	**Course Company**	**Date Attended**
Introduction to the Oilfield	STAG Geological	Sept 2001
FOCUS 1	Randy Smith Training	Nov 2001
Sand Control Technology	ICCI	Apr 2002
Intro to WellPlan for Windows	Landmark EAME	Apr 2002
Basic Mud	STAG Geological	Apr 2002
Basic Calculations	STAG Geological	Apr 2002
Drilling Practices	Prentice Training Co. Inc.	Apr 2002
Well Planning 1	Prentice Training Co. Inc.	May 2002

Communications Skills	Bell Amethyst	May 2002
Well Planning II	Prentice Training Co. Inc	July 2003
IWCF Subsea Supervisors Well Control	ADTI	Aug 2003
Advanced Drilling Fluids	MI Drilling Fluids	Oct 2003
Level 1 Examination	ADTI	Nov 2003
Drilling Optimization	Prentice Training Co. Inc	Mar 2004
Drillstring Failure	Prentice Training Co. Inc	Mar 2004
Abnormal Formation Pressure	Prentice Training Co. Inc	Mar 2004
Advanced Casing Design	Prentice Training Co. Inc	Mar 2004
Cementing	Halliburton	Mar 2004
Well Plan for Windows	Halliburton Landmark	Mar 2004
Wireline for Drilling Engineers	Schlumberger	Apr 2004
Technical Report Writing	ADTI	May 2005
Offshore Survival		Sept 2007
FOCUS III	ADTI	Oct 2005
Stresscheck for Windows	Halliburton Landmark	Nov 2005
HSE Training Course	ADTI	Dec 2005
Directional Drilling	Pathfinder	Mar 2006
Excel (Intermediate & Advanced)	Rainbow IT Consultants	Mar 2006
Business Awareness	Scottish Training Consultants	Mar 2006
P1 model	Peak	May 2007
ERD / Stuckpipe awareness	Fearnely Procter Group	July 2008
IWCF Subsea Supervisors Well control	Caledonia	Nov 2008